SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

December 9, 1939

Visiting Eagles

See Page 383

A SCIENCE SERVICE PUBLICATION

Do You Know?

Pneumonia is a common cause of death among wild animals.

Canals scattered through the Southwest show how extensively prehistoric Indians practised irrigation.

Aside from owls and marsh hawks, birds in general see out of one eye on each side of the head instead of focussing with both eyes on an object.

The biggest army of ancient times was that of Persian conqueror Xerxes, fifth century B.C., who had over 2,600,000 fighters, according to Herodotus.

Hemp for making rope is being grown in Kentucky, but because the plant also yields the marihuana drug, a Federal permit is required for its cultivation.

Valuable oyster fisheries off Puget Sound are threatened with destruction, due to inroads of a marine snail or borer introduced from Japan with seed oysters.

A wax film, useful in keeping many vegetables fresher in storage, did not work well with leafy vegetables or bunched root crops, in experiments at Cornell University.

Close correlation of events in East and West is nothing new, says Dr. F. J. Teggart of the University of California: between 58 B.C. and 107 A.D., forty uprisings of barbarians in Europe followed outbreak of war in western China or on eastern frontiers of the Roman Empire.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

AERONAUTICS

Why is the autogiro more stable than the airplane? p. 371

ARCHAEOLOGY

Why are the lines of modern battle of interest to archaeologists? p. 375

BACTERIOLOGY

How do bacteria aid in preventing soil erosion? p. 383

CHEMISTRY

What chemicals are critical for a nation at war? p. 381

ENGINEERING

What advantages are seen by the British in concrete ships? p. 377

MEDICINE

How has the diagnosis of pneumonia been speeded? p. 373

What evidence has been found indicating that the hay-fever producing chemical in ragweed pollen may be an acid? p. 377

ORNITHOLOGY

What does a mother eagle do when her nest is invaded by humans? p. 383

PHYSIOLOGY

How can hibernation be produced in warm-blooded animals? p. 376

POPULATION

Where has the biggest migration in the world recently taken place? p. 373

PSYCHIATRY

Why do some people hate their jobs and other feel "addicted" to it? p. 378

Why is murder seen as a form of suicide? p. 377

PSYCHOLOGY

How do religious groups differ on how to keep America out of war? p. 380

What are the most unpopular jobs? p. 374

What trade names are commonly mistaken for generic terms? p. 374

PUBLIC HEALTH

Why are reports of alcoholic deaths misleading? p. 376

PUBLIC HEALTH—ENGINEERING

Why has a coroner recommended windshields that will knock out when struck from within? p. 372

To harvest buffalo grass and seed, which mature close to the ground, a government scientist cleverly adapted an ordinary lawn mower.

A bird can change its wing area in flight, which is something man has been unable to do in a plane, says the American Wildlife Institute.

The federal government distributed a few yards of calico to each of 3,332 Indians in six New York tribes during November—annual fulfillment duty from a peace and friendship treaty signed with the Iroquois Nov. 11, 1794.

About one-third of the potatoes grown in this country are used on the farms where grown.

Tests for predicting ability in pharmaceutical work are being studied by the Association of Colleges of Pharmacy.

A 12-year-old boy won the award for the best bloom in the recent Rose Show conducted by the Portland Rose Society.

Airplane equipment is virtually a "must" for extensive scientific exploration in unknown regions, says the American Museum of Natural History.

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AERONAUTICS

Autogiro Possesses Stability Which Airplane Cannot Match

Rotor With Flapping Hinge at Some Distance From Center of Rotation Is Stable; Wing Not Inherently So

THE IMPORTANT research finding, that autogiros with their whirling rotor blades have more inherent longitudinal stability (ability to react against a pitching motion in flight) than do normal airplanes, was announced at the concluding meeting of the Philadelphia chapter of the Institute of Aeronautical Sciences by Prof. Alexander Klemin of New York University, in a scientific report with Lieut. Victor Haugen, U. S. Army Air Corps, and S. B. Sherwin, first holder of the newly created Cierva Memorial Fellowship at New York University.

The new report contradicts some previous wind tunnel experiments and is in accordance with practical experience. The theoretical investigations show that the rotor with its flapping hinge placed at some distance from the center of rotation is definitely stable, Prof. Klemin declared. In this the rotor is superior to the airplane wing which has no inherent stability of its own.

The investigations also show that as the rotor is placed above the center of gravity of the machine with its axis of rotation somewhat behind the center of gravity, the autogiro will be stable without the intervention of the horizontal tail surfaces. Such inherent stability without horizontal tail action is impossible in the airplane. Furthermore, rotors of the direct control type are pivoted about a suitable point so that not only is it possible to secure longitudinal control without use of an elevator but the rotor tends to change its inclination so as to increase stability. In the airplane, flying with free stick, the stability is less than flying with stick held in a fixed position. In the autogiro with pivoted rotor, on the other hand, there is a dual stabilizing effect. Thus from the point of view of horizontal static stability, the autogiro has distinct points of superiority over the airplane.

To remove the discrepancy existing between wind tunnel data and theoretical and practical reasoning, Lieut. Haugen will conduct an original investigation into the stability of the rotor with offset hinge, systematically varying the position of the hinge.

One of the most interesting problems in the helicopter today is whether superimposed air screws, as in the Breguet helicopter, or air screw placed on either side of the fusilage, as in the Focke helicopter, are more efficient. Mr. Sherwin has devised a special apparatus for investigating this point in the nine-foot wind tunnel of the Daniel Guggenheim School of Aeronautics of New York University.

Science News Letter, December 9, 1939

Brilliant Future Forecast

ROTARY winged aircraft of the autogiro or helicopter type will usher in the third stage of growth in man's conquest of the air, Igor I. Sikorsky, noted pilot and designer, told the meeting.

Mr. Sikorsky forecast a brilliant future for planes with rotary wings, particularly in the field of private flying, to add to lighter-than-air and heavier-than-air transportation, the two earlier stages of man's aerial transport.

By rotary wings, Mr. Sikorsky said, private flying can come into its own, for planes of this type overcome the main handicap of private flying today which is lack of ability to take off and land in small spaces. It is this handicap, he feels, rather than lack of speed, lack of safety or even high cost of operation which has limited private aviation.

For military use, Mr. Sikorsky foresees the day when rotary wing planes attached to the Navy will be used for rescue work at sea, the laying of mines, quick observation from small, isolated ships, and bombing.

Attached to an army, he suggested, rotary winged planes could effectively take over many of the communications tasks now performed by motorcycles, automobiles, and even horses. Observations and control of artillery fire and bombing attack would be possible.

Science News Letter, December 9, 1939

MEASURING BRIGHTNESS

A new instrument that measures how well streets and roads are lighted. Mounted on an automobile, it records the true brightness of pavement, brightness of objects along or on the road, interference to seeing caused by glare. Its use may make possible saving of some of the 5000 lives lost annually in traffic accidents merely because motorists could not see safely.

Helicopter Ferries

BY means of helicopters and other rotary wing airplanes which can rise and descend vertically a speedy "ferry" service between distant airports and busy metropolitan centers will be possible, C. E. McCollum of Transcontinental & Western Air, Inc., told the Institute of Aeronautical Sciences.

In carrying more than 1,500,000 passengers a year the 17 major airlines of the nation encounter a great waste of time in getting the passengers to and from airports. Mr. McCollum estimated that in a single year, an hour for each passenger is needed in city-to-airport travel, on the average. This means that in a single year, 173 years of time was spent in the tedious crawl through busy streets in sharp contrast to the swift airplane flight to or from the airport.

The fantastic visions of great roof-top airports atop skyscrapers have little economic justification, Mr. Collum feels.

With the advent of rotary wing planes, a ferry service is wholly practical and it is much cheaper to use small plots of land in the city—no bigger than a square block—for this purpose. With the practical development now of the vertical beam radio altimeter it would be practical even to make landings through dense fog down into the "gorges" between a great city's skyscrapers. The new altimeter, in a hovering helicopter, could give an accurate picture of buildings beneath just as a sea captain now "heaves the lead" to get soundings in a ship's channel.

Science News Letter, December 9, 1939

CHEMISTRY

Solid "Alcohol" Exhibited At Field Museum, Chicago

SOLID chunks of "alcohol" are on exhibition at the Field Museum of Natural History, Chicago. It isn't some new fangled chemical but the mineral stibnite, in sixteenth century Europe called "alcohol." This antimony sulfide, most important ore of antimony, was known to the Arabs as "kohl," from the Arabic for color or stain. The powdered mineral was used as a cosmetic to increase the apparent size of the eye by blackening the eyelids. "Al" is Arabic for "the" . . . hence "al-kohl" or alcohol.

As years passed, alcohol became a general term for all sublimed powders and later for all distillates. In the last century the use of the word became restricted to the class of organic compounds that contain the hydroxyl group.

Science News Letter, December 9, 1939

PUBLIC HEALTH—ENGINEERING

"Knockout" Windshields Urged To Reduce Injuries

"KNOCKOUT" windshields for automobiles to reduce the toll of head and neck injuries which doctors now encounter so frequently in motor car accidents are suggested by Dr. B. L. Knight of Cedar Rapids, Iowa. (*Journal, American Medical Association,* Dec. 2.)

Noting that "the most serious medical problem in the United States today is the motor accident," Dr. Knight suggests the construction of windshields which would fall outward, without breaking, when struck with a force of more than 50 pounds from the inside.

The idea is that in the quick stop of an accident the passenger's body and head would be thrown against the windshield and instead of being severely injured by impact with the rigidly-held and very strong safety glass, the blow would merely drive out the windshield when the force was more than 50 pounds.

Problems of designing such a windshield which would not rattle or fall out of its own accord would be encountered, but they do not appear insurmountable.

Dr. Knight, who as coroner for Linn County, Iowa, is frequently called in on fatal highway accidents, has other suggestions for increasing safety. They include:

1. Bumpers entirely around the car, with a removable section to permit changing tires, which would prevent accidents in which the bumper of a car locks into the wheel of another and overturns the car.

2. Improved highway markings preferably right on the pavement in the line of vision.

3. Greater streamlining of the lower body of motor cars so that the fenders do not protrude.

4. Compulsory driver's tests after an accident to discover any driver abnormalities.

Science News Letter, December 9, 1939

PHYSICS

New Electrical Micrometer Measures .000,005 Inch

A NEW and valuable kind of electrical micrometer, which uses a special radio tube to measure distances as small as five millionths of an inch, has been developed at the U. S. Naval Research Laboratory in Washington.

Dr. Ross Gunn, physicist and superintendent of the mechanics and electricity division of the Laboratory, described the new instrument at the meeting of the American Society of Mechanical Engineers in Philadelphia.

The electrical micrometer is a radio tube consisting of an electron-emitting filament and two tiny plates, insulated from one another and jointly supported by a rod which goes into an elastic diaphragm fixed in the bulbous part of the radio tube.

Outside the tube, and attached to the diaphragm, is spot welded another small rod whose job it is to detect tiny displacements.

Slight displacements of this rod are communicated through the diaphragm into the plates of the tube which move very slightly from their normal positions. This motion brings one plate nearer to the filament and the other plate farther away, resulting in a decided difference in flow of electrical current within the tube.

Normally the current to the two plates balances and zero current is obtained. With the slight shift of plate distance current flows in an amount proportional to the displacement. This current is put through a micrometer and the deflection of the needle of this instrument is a measure of original microscopic displacements.

Dr. Gunn stressed the compactness and stability of the new device as well as its great versatility to a variety of measurements. The electrical micrometer can be used to measure displacements at

remote points and these displacements may be due to tension, compression or torsion.

By attaching a small mass to the external detecting arm of the tube it can be converted into an accelerometer. By the use of elastic bellows fluid pressures can be measured. By using large calibrated proving rings, its range of measurement can be enlarged indefinitely and it has proved useful as an accessory to limit and tolerance gauges.

Because it is able to follow vibrations up to 200 cycles a second it can be attached to an oscillograph and thus produce a visual pattern comparable to the motions of the tiny detecting rod.

Science News Letter, December 9, 1939

POPULATION

Biggest Migration in World Is Chinese Trek to West

40,000,000 People, Including More Than 30 Universities And Their Students, In Mass Escape From Invasion

IT IS impossible to realize, for those who have not seen, but China's vast wave of refugees moving West now totals 40,000,000.

Estimating this migration—which is the biggest transplanting of human beings in world history—at 40,000,000 is conservative. So declares Dr. David C. Graham, curator of the West China Union University Museum of Archaeology, who has returned to America from the part of China which is suddenly and dramatically invaded by farmers, merchants, teachers, millions of all classes fleeing from areas of Japanese invasion.

"A year ago," said Dr. Graham, "West China had received 30,000,000. Probably another 10,000,000 have come this year."

Despite lack of funds and other handicaps, the Chinese are amazingly resourceful at organizing their new boom area, Dr. Graham has observed. More than 30 universities driven out of East China are established in the West. Farmers from East China find themselves in the bread basket of their great country. Rainfall is heavy enough to make droughts rare. And farmers can plow and sow with less fear of flood, too, since when the Yangtze overflows in this hilly region, it does far less damage than rivers in the flat East. Many Chinese business men have come West bringing their factory hands and machinery to make a new start.

"The intelligentsia of China are thronging West with the other pioneers," says Dr. Graham. "Leaders who got their education in Columbia University and other American schools are establishing up-to-date schooling for the children. China is far-sightedly conserving her skilled people. University graduates who volunteer to fight have been told that their duty is to teach soil conservation or whatever other special knowledge they have to give."

China's 400,000,000 people are determined to resist Japanese despotism, and given a ghost of a chance they will become a democratic nation, Dr. Graham is convinced. A potential democracy of so many millions in the Far East is a factor which the Western World might well consider seriously, he points out. China, if thrown back on Soviet Russia too long for aid and supplies, may drift toward communism, but the picture of democratic government is far more attractive to the Chinese than is that of communistic rule.

Science News Letter, December 9, 1939

MEDICINE

Pneumonia Control Speeded By New Diagnostic Method

LATEST aid in the fight to save pneumonia-threatened lives, especially among children, is a new, speedy diagnostic technic which can shorten to six hours or less the time before starting effective treatment. Details of the new technic are reported by Dr. Franklin D. Poole and Miss Mildred D. Fousek, of the New Haven, Conn., Orphan Asylum and Yale University School of Medicine. (*Journal, American Medical Association,* Nov. 18)

Rapid typing of pneumonia germs found in the patient's sputum, in order to determine which type of anti-pneumonia serum should be used in treatment, has already been accomplished, but often in children and sometimes in adults delay still occurs because of difficulty in obtaining sputum for the test. The New Haven scientists have gotten around this difficulty by applying the usual speedy typing technic to material obtained by swabbing the patient's nose.

The method is valuable, it is pointed out, even though many pneumonia patients are now treated with the chemical, sulfapyridine, instead of with anti-pneumonia serum, because it is desirable for the doctor to know whether the pneumonia is caused by a pneumonia germ or by the streptococcus.

Small doses of sulfapyridine given for a short time in treatment of pneumonia in children are recommended by Drs. Charles Hendee Smith and Rosa Lee Nemir, of New York, in a report,

appearing in the same issue of the *Journal*, of their results with sulfapyridine treatment in 93 cases of pneumonia in children.

The value of sulfapyridine in saving lives, especially from Type III pneumonia for which serum treatment does not have as good a life-saving record as it does in other types, was stressed in another report to the A.M.A. Journal by Drs. Norman Plummer and Herbert K. Ensworth, of New York. Among 270 sulfapyridine-treated patients at New York and Bellevue Hospitals there were only 34 deaths, they report. Of these, 11 died within 24 hours of the beginning of treatment, which reduces the death-rate in this group to 8.5%. Serum treatment was used in addition to sulfapyridine in 102 of the cases. In serum-treated pneumonia cases a deathrate of about 18% to 20% has previously been reported from Bellevue Hospital. Besides reducing the deathrate, sulfapyridine shortens the period of fever and sterilizes the blood stream, Drs. Plummer and Ensworth reported.

Science News Letter, December 9, 1939

PSYCHOLOGY

Girls Like Stenography Men Want To Be Flyers

At Meeting in Washington, the Practical Applications Of Psychology Are Discussed; Aid Offered to Government

FAVORITE occupation among both men and boys is flying, a survey revealed to Dr. Glen U. Cleeton of the Carnegie Institute of Technology, who reported his findings to the American Association for Applied Psychology in Washington.

Girls want most to be secretaries, typists or stenographers.

Very popular also among men and college boys in this scientific age are the jobs of inventor, chemist, scientific research worker, and—in contrast—athletic director. Younger boys want to be carpenters or machinists.

Most detested among all the jobs for men is that of the undertaker, but men dislike this job less than do boys. Unpopular also were the jobs of clergyman, music teacher and life insurance salesman.

Girls dread most the jobs of laundress, cleaner, factory worker, politician and baker.

Science News Letter, December 9, 1939

Practical Tests Urged

PRACTICAL tests of ability to recognize forms and spatial relations and speed in mechanical assembly were urged in place of the "Army Alpha," World War intelligence test, for the selection of Uncle Sam's new recruits for aviation mechanics.

These tests were found to be satisfactory for picking the boys who would make good on their training course, Dr. Willard Harrell, of the University of Illinois, reported from tests of more than 600 students of the United States Army Air Corps Technical School.

Science News Letter, December 9, 1939

Stand Ready to Aid

PSYCHOLOGISTS stand ready and willing to help formulate a program for the best use of man-power in our national defense. Official notice of the intention of these experts on the human mind to enlist the immediate aid of their science in expanding America's defense forces was served by Prof. Donald G. Paterson, of the University of Minnesota, in his address as president.

Psychologists are available, he indicated, who are professionally trained to make applications of their science in the practical service of mankind in industry and in the nation's service. Psychologists who were mobilized in 1918 to aid in the World War by making practical use of their scientific knowledge, went back to their laboratories with a new appreciation of applied psychology as distinguished from the "pure science" taught earlier. Now many of their students are ready to contribute in a similar way.

Science News Letter, December 9, 1939

Miss Errors in Novel

PROOF-READERS miss errors more often in proof on a good novel than in less interesting technical matter, Dr. Vernon P. Scheidt, of the Waverly Press, has found.

Rest periods help the accuracy of proof-readers, he told the meeting. Both speed and accuracy drop after three hours of reading and even with rest periods efficiency goes down when the reading time extends beyond six hours.

To insure greatest accuracy in proof-reading, a copy-holder should read aloud to the proof-reader, he found. Looking back and forth from copy to proof is least efficient.

Science News Letter, December 9, 1939

Need Understanding

A NEW deal for the cured tuberculosis patient so that he has a fair chance to return to normal life was advocated by Dr. Morton A. Seidenfeld, of the National Jewish Hospital at Denver, Colo.

The "Magic Mountain" personality of the tuberculous, described by the novelist Thomas Mann as symbolic of their uncertainty, mental unrest and feeling of social insecurity, is due, Dr. Seidenfeld charged, to the failure of the public to understand the tuberculous.

Fear that the patient experiences about the attitude of others makes him depressed and nervous, gloomy and unfriendly and ashamed of his illness.

The public should learn that the patient who has undergone proper medical treatment and been taught how to take care of himself is really a public health asset, Dr. Seidenfeld declared.

Science News Letter, December 9, 1939

Mistake Trade Names

IF THE public calls all cameras "Kodaks" or all phonographs "Victrolas," they may be giving a lot of free advertising to the manufacturers, but they are giving them some worries. A great many companies try to avoid this misuse of trade names for generic names of products because they fear that the consumer will be led by it to accept imitations, Dr. John G. Jenkins, of the University of Maryland, told the meeting.

As a matter of fact, however, Kodak is generally recognized as a trade name, Dr. Jenkins found through tests on his students. But Mimeograph was mistaken for a name for all duplicating machines by two-thirds of those tested. Most people similarly mistake Dictaphone and Knee Action.

Mixed in Dr. Jenkins' test with the trade names were such truly generic

terms as calendar, altimeter, humidifier, safety glass, chromium plate, and incinerator. Other trade names included Caterpillar Tractor, Lysol, Frigidaire, and Thermos Bottle.

Science News Letter, December 9, 1939

Reading More Than Visual

READING is a great deal more than just seeing the printed page, but psychologists have learned relatively little about the process of comprehension, Dr. Robert P. Larson of the University of Illinois, told his colleagues at the meeting.

Students who have difficulty in reading may comprehend very well what is read to them, or what they hear in a lecture, Dr. Larson found. Others who read well may have difficulty in listening.

Remedial training in listening was urged by Dr. Larson for some students.

In general, difficult material is comprehended best when read, the experiment revealed, and for this reason, Dr. Larson recommended that material presented orally as in lectures or radio talks should be less difficult than printed material in order to be comprehended with equal effectiveness.

Questioning revealed that some good readers who were poor hearers were hampered when the rate of speaking was not adjusted to their individual needs; others were unable to concentrate while listening.

Poor readers-good hearers reported inability to concentrate on reading, intense dislike for reading, a habit of skimming and dependence in comprehension upon a speaker's intonations, and pauses.

Comprehension, Dr. Larson concluded, is largely a centrally determined function operating independently of the mode of presentation of the material. Reading seems to be largely language or thought activity.

Little improvement in this central comprehension process can be obtained, he believes, by excessive mechanization of the reading skills.

Science News Letter, December 9, 1939

● RADIO

G. H. Collingwood, Forester of the American Forestry Association will answer questions on Christmas trees and give hints on their care as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, December 18, 4:30 p.m., EST, 3:30 CST, 2:30 MST, 1:30 PST. Listen in on your local station. Listen in each Monday

ARCHAEOLOGY

Battle Fronts of Europe's War Predestined Long Ago

Director of Archaeological Expeditions To Discover Remains of Prehistoric Balkan Wars Comments on Present

By DR. VLADIMIR J. FEWKES

Acting Director, American School of Prehistoric Research.

BATTLE fronts and vantage points of the present European War were predestined long ago by nature. Wherever the battle lines form in Europe, they are almost bound to follow lines of previous wars. For, from the dawn of human culture, man has had the warring habit, and one of his early discoveries was to recognize the strategic advantages of rivers, hills, and mountain passes.

The German Siegfried line and the French Maginot line are close to ancient Roman defenses which guarded outposts of the empire against Teutonic barbarians. Ancient Gaul was pretty well peppered with fortified towns, forts and camps. So were Roman provinces in the regions of Hungary, western Yugoslavia, and Austria. All of Rome's provinces were thoroughly militarized, and arteries of strategic significance were protected by intricate defense systems.

During the World War, soldiers digging trenches in various parts of the Balkans cut through ancient archaeological remains. Gunners established machine gun nests in ruins of Greek, Roman, or Byzantine forts. Labor crews tunneled or excavated prehistoric mounds, as they worked at sites chosen as advantageous for ammunition dumps, first aid stations, and the like. They reverted even to using caves, and in fact especially welcomed finding such shelters.

Little did these World War soldiers realize that many, many times before them, the ground had been soaked with blood. Nor did they think anything of the damage war was doing to archaeological science and its efforts to reconstruct European past events.

That salient vantage points have repeatedly served their military purpose through centuries, and even thousands of years, is evident from archaeological surveying in Europe. During the past ten years, the American School of Prehistoric Research, Harvard University, and the University Museum of the University of Pennsylvania have dispatched expeditions to seek traces of peaceful and warlike activity in the Balkans' past.

As director of these Balkan expeditions, the writer has had an opportunity to analyze the nature, location, and distribution of the many strongholds encountered. They shed an interesting light on modern military strategy.

Should the current war spread into the Balkan region, there is little doubt that many of these sites would see war service again. In all major river valleys crossing the Balkan massif, both sides in the World War called ancient ruins into use. This is only natural when it is realized that the Romans themselves took over and improved trails and routes already in existence for their arteries of trade and transportation; and the best protection for the vital Roman highways, in the mountains, at any rate, was from hilltops. Knowing this, an archaeologist searching for lost ancient sites in central and southern Europe cannot allow a single hill to escape his careful scrutiny.

During the World War, the once-famous Via Egnatia saw much action. Romans built this highway to run from present-day Thessalonike (Greece) to Durres, the chief seaport of Albania, and it is still traceable in the mountainous terrain. The road bed itself has been changed, but a line of ruins marking the protective outposts provide a dependable guide for retracing the Roman road. World War troops used the ancient ruins for machine gun emplacements.

East of Belgrade, Yugoslavia's capital, runs the Via Trajana which Roman engineers finally succeeded in building by 104 A. D. through the Danubian gorge of Iron Gate. This route was an important factor in Rome's conquest of the formidable Dacians, who were finally subdued to the status of Roman provincials. To protect the road and to guard the Roman limes, a line of forts and camps in modern pillbox manner was established on either end of the Iron Gate pass, and within it, too.

Ruins of these ancient Roman pillboxes now have so *(Turn to page 380)*

PHYSIOLOGY

Insulin Injections Produce Hibernation

WARM-BLOODED animals can be sent into hibernation artificially by injecting insulin, or a combination of insulin and magnesium chloride, into their veins, Dr. Paavo Suomalainen of the Helsinki Biochemical Institute has discovered.

Working with European hedgehogs, Dr. Suomalainen found that the injections caused a drop in blood sugar content to less than half normal, and produced the cold-blooded state characteristic of warm-blooded animals in hibernation.

The animals remained asleep as long as he kept them in a refrigerator, at temperatures around freezing point. When he removed them to a warm room, at a temperature of from 70 to 75 degrees Fahrenheit, they awoke and returned to the normal warm-blooded state.

Science News Letter, December 9, 1939

CHEMISTRY

Self-Sufficiency in Rubber Wanted By Soviet Russia

SOVIET RUSSIA is endeavoring to become wholly independent of outside sources of rubber by 1942, principally by the development of the synthetic rubber industry that already supplies more than two-thirds of the needs of the USSR, it is stated in the *Far Eastern Survey* (Nov. 8).

There have been some complaints of the quality of synthetic tires, and Soviet chemists are now trying to overcome this difficulty, with the aim of increasing the life of the ordinary automobile tire to 21,000 miles.

Official figures for the present and hoped-for production in the USSR are not given, but on the basis of known present and scheduled future automobile production the *Survey* estimates the present output to be near the 100,000-ton mark or approximately 10% of recent world production of natural rubber.

Russia's home production of rubber has been developed practically step for step with the country's consumption of that commodity. Russia has never imported more than about 3% of the world output of natural rubber, so that her disappearance from the outside market would not cause any particular disturbance.

Only if the use of artificial rubber, now being pushed on a large scale in Germany as well as Russia, should become common in other lands would there be real cause for plantation interests to worry. As yet, artificial rubber does not compete seriously with the natural product in either price or quality: the hoped-for 21,000-mile life of synthetic tires in Russia would be considered nothing extraordinary for present-type natural rubber tires in this country.

In addition to large-scale production of synthetic rubber, the USSR is striving for a supply of natural rubber from plants that can be grown within present Russian boundaries; but supplies from this source are as yet of little importance in the total rubber economy of the country.

Science News Letter, December 9, 1939

PUBLIC HEALTH

Alcohol Kills Three Times As Many As Reports Show

ALCOHOL kills or is at least partly responsible for deaths of more than three times as many persons in the United States as the official records show. This charge of inaccuracy in reporting causes of deaths has been made by the U. S. Census Bureau Division of Vital Statistics which keeps records of births and deaths in the country.

Three out of every 1,000 deaths in the United States are due to alcoholism, according to current reports to the Census Bureau. But when both primary and secondary causes of death as shown on death certificates are considered, alcoholism is found to play a part in more than 10 out of every 1,000 deaths.

Confidential inquiry among a large group of physicians by another physician revealed that alcoholism had been reported on the death certificate in less than half the deaths which it had actually caused.

Reported alcohol deaths have been reduced 51.9% during the period 1910 to 1937. This is about twice the decline in the death rate from all causes during the same period. Most alcohol deaths occur in middle age and are much more frequent among men than women. The proportion of all alcohol deaths differs very little between races, but there are marked differences in different regions of the country and different states. Nevada recorded the highest proportion of deaths from alcoholism, while the lowest proportion was recorded from Kansas, Louisiana, Mississippi, Missouri, Nebraska, Utah and Vermont.

Science News Letter, December 9, 1939

IN SCIEN

METALLURGY

Alcohol Helps Turn Iron Into Hardened Steel

HOW soft iron changes under the influence of alcohol, into tough hard steel was demonstrated at the Westinghouse Research Laboratories, Pittsburgh, by John R. Gier, research metallurgist.

By projecting the image of a small hot, soft iron wire on a screen Mr. Gier was able to show that in the presence of alcohol vapor the soft iron quickly turned into hardened steel.

Electric current passing through the demonstration wire heated it to and above its crystalline transformation point at a temperature of 1670 degrees Fahrenheit in an atmosphere of hydrogen. As the temperature rose the image of the wire showed that it expanded and sagged.

At the transformation point hydrogen gas bearing alcohol vapor was passed over the wire for a few minutes and the carbon from the alcohol entered into chemical combination with the wire.

Whereas without alcohol the wire, on cooling, gradually returned to its original tautness it did not do so after alcohol's carbon atoms entered into the hot iron wire and made it hard. On cooling, in this case, it still sagged and had a permanent set.

Westinghouse engineers developed the exhibit apparatus to illustrate the effectiveness of controlled atmosphere in the hardening of steels.

Science News Letter, December 9, 1939

MEDICINE

Pneumonia Case Fatalities Cut By Two-Thirds

THE NUMBER of fatal pneumonia cases in the Civilian Conservation Corps, whose members have been given anti-pneumonia vaccine, dropped this year to a rate one-third that of the preceding five years. How much of this and of the reduction in total number of pneumonia cases is due to use of the vaccine cannot yet be stated with certainty, Robert Fechner, CCC Director, pointed out in his announcement of the figures.

Science News Letter, December 9, 1939

E FIELDS

ARCHAEOLOGY

Shutdown Halts Digging at Area Slated For Flooding

A PREHISTORIC crossroads, where at least three early Indian tribes left traces of their presence, has been discovered by archaeologists in the area of north-central Texas soon to be flooded by Possum Kingdom Dam.

Shortage of WPA workers has temporarily halted joint efforts of the University of Texas and the WPA to salvage all possible Indian material in the sector before the dam is completed late in 1940.

Bison which thronged Possum Kingdom Basin are believed the attraction which drew aborigines from various parts of Texas. The excavations thus far have shown a new southern limit to which certain cultural traits of Plains Indians spread. Another type of Indian in the area was the "burnt-rock mound builder." Typical East Texas Indians who had a Mississippi Valley pattern of living also showed their presence in the Possum Kingdom country, but whether they were then heading toward an East Texas destination, or had come from there, remains to be cleared up.

Hope that the shutdown will be brief is expressed by A. T. Jackson of the University, in charge of excavations, because time lost now means "work can never be done."

Science News Letter, December 9, 1939

PSYCHIATRY

Murder Is Seen as Bizarre Form of Attempted Suicide

WHEN a murder is committed, the psychiatrists can sometimes pronounce it: "Suicide." Not suicide of the victim, but the result of a suicidal tendency in the murderer.

Mentally ill minds studied by Dr. Philip R. Lehrman, Clinical Professor of Neurology and Psychiatry at Columbia University, saw in other persons their own hated selves. They were driven by their own self-hatred to the killing of others.

Murderers studied by Dr. Lehrman had been preoccupied with suicidal thoughts during adolescence. An insane man who killed his wife allegedly because he was driven by fear that she would confine him in a mental hospital, was really striving to annihilate the effeminate side of his own nature. Details of Dr. Lehrman's study, "Some Unconscious Determinants in Homicide," are made available in the current issue of the *Psychiatric Quarterly*. It is not by mere chance, he found, that murder and suicide are so often a single act.

Dr. Lehrman's conclusions lead us to conjecture that even normal men going to war may attribute to the enemy, unconsciously perhaps, their own worst faults. The killing then becomes in their minds almost an act of mercy—a release from such base elements.

Perhaps it is from this tendency that war's atrocity stories grow—attributing to the enemy the most revolting and even unthinkable acts, reflecting the hatred and forbidden part of man's inner nature, long suppressed by parental, religious and other social influences. In turn, the atrocity stories aid in projecting onto the enemy the vile nature that men want to crush.

Science News Letter, December 9, 1939

ENGINEERING

British To Build Concrete Ships To Save Steel

BRITISH shipbuilders, working under the new Ministry of Shipping are planning large scale construction of ocean-going vessels built of reenforced concrete instead of steel. Reenforced concrete ships, tried successfully during the last war in Scandinavia, France, Italy and on a large scale in the United States, require less steel and skilled labor for their construction than do ordinary vessels.

Tried before in Britain only on an extremely limited experimental basis, concrete ship construction demands only a slipway and ordinary building contractor's equipment. Maintenance of the finished ship is also reduced, as cleaning and painting are unnecessary.

Though entirely seaworthy, the concrete craft are considerably heavier than steel vessels of the same size and are slower. They are often launched upside down because construction is easier and cheaper if the keel is uppermost. The hull is righted by flooding compartments on one side. Several concrete ships of World War vintage are still in service. Their construction is approved by experts of Lloyd's Register of Shipping.

Science News Letter, December 9, 1939

GENERAL SCIENCE

Bickel and Swanson Elected Science Service Trustees

THE ELECTION of Karl Bickel and Neil H. Swanson as Science Service Trustees is announced by Science Service. Mr. Bickel was formerly president of United Press and he has long been associated with the Scripps-Howard Newspapers. Neil H. Swanson is managing editor of the *Baltimore Evening Sun* and he is also an historical novelist, one of whose books has just been made into a motion picture.

Mr. Bickel fills the vacancy caused by the resignation of W. W. Hawkins, chairman of the board of the Scripps-Howard Newspapers, who left the Science Service board on account of added duties caused by the international situation. Mr. Swanson fills the vacancy caused by the resignation of J. Edwin Murphy, formerly managing editor of the *Baltimore Evening Sun*.

Science News Letter, December 9, 1939

MEDICINE

Make Chemical Approach To Hay-Fever Problem

A FIRST step in a fundamental chemical approach to the hay-fever problem has been taken by a group of scientists, Drs. Walter L. Winkenwerder, Mary V. Buell and John Eager Howard, at the Johns Hopkins University.

Like G-men on the trail of a criminal, these scientists are on the trail of the exact chemical in ragweed pollen that makes pollen-sensitive persons sniffle and sneeze in the pollen laden breezes of late summer.

Pollen-sensitive persons, they report (*Science*, Oct. 13) are also sensitive to certain acids and their derivatives, among them those from yeast, thymus gland, beef heart and tea leaves. The acids are called nucleic acids because they come from the nuclei of cells. They produce the same wheal on the skin that ragweed pollen does in sensitive persons.

Pollen, being a germ cell, probably also contains nucleic acid. Next step will be to determine whether it does contain such an acid and if so, whether hay-fever patients are sensitive to it. Dr. Winkenwerder and associates think that the criminal in the pollen is more likely to be a protein than an acid, but since this is the first time that pollen-sensitive persons have been found sensitive to a known chemical substance, they are following the clue of the acid.

Science News Letter, December 9, 1939

PSYCHIATRY

Do You Hate Your Job?

To the Neurotic, Work Is Either a Poison To Avoid Or a Drug To Which He Is Addicted, But Never a Joy

By MARJORIE VAN DE WATER

YOU know the man who hates his job. And the woman who is passionately devoted to hers. Well, they are both probably neurotic.

To most of us, work is a necessity. Without it, we don't eat. And without it, we can never make a place for ourselves — become respected, influential, honored.

Despite its necessity, work need not be drudgery. There is, for the individual in congenial employment, a real pleasure in the exercise of his talents—a sheer joy in activity not unlike the delight that children have in play.

But a normal person can take it or leave it. He arrives in the morning with some degree of enthusiasm. He leaves at the end of the day, willing to give it up for other interests in home, club, church or place of recreation.

Not so the neurotic. To him, work is either a poison to be hated or a drug to which he is addicted. In either case he is enslaved. He works, not for the satisfaction of accomplishment or pay, but because he is relentlessly driven by some mysterious inner force he can neither understand or control.

Neurotic attitudes toward work have been made the subject of scientific study by Dr. Bernard S. Robbins, of the Vanderbilt Clinic.

Not Efficient

The neurotic in the office is not the most efficient worker. His desk (or hers for the neurotic is most frequently a woman) is piled high with tasks undone. Many of them may be self-invented jobs undertaken without enthusiasm but with the feeling that no one else can do them so well.

The work addict is still toiling at her desk when others have gone whistling home. Holidays and Sundays see her in the same spot, bending with nervous intensity over work never completed, never entirely laid aside.

If the work addict is faced with a Sunday at home or a vacation, she will be unhappy. Restlessly she will pace the floor and worry about the things left undone at the office.

Physicians recognize a disease entity which is called the "Sunday neurosis." Anxiety fills the one day of rest for sufferers from this ill. They are under tension all day long and are profoundly dissatisfied whenever they are faced with a period of leisure.

Now extreme enthusiasm for a job need not necessarily point to the neurotic. Many an ambitious youngster has forged ahead by just such wholehearted zeal for his work.

The difference is that the normal work enthusiast is motivated by a definite purpose. He is working for a practical goal.

The work addict is merely trying to drown himself in it. By keeping himself eternally busy, he manages to prevent his anxieties from coming up in his conscious mind to overwhelm him.

Death Kiss

"The person and his work," said Dr. Robbins in his report to the scientific journal *Psychiatry,* "are bound together not in friendly and joyous union, but in a kind of death kiss."

Not all neurotics are work addicts. Just as much a sign of mental ill health is the extreme resentment with which others view their jobs—work to them is a phobia.

"Work is something foreign and alien to the neurotic," explained Dr. Robbins, "a task externally imposed, a duty to which they must submit and about which they have no choice. They can do nothing but comply."

The work phobic has no genuine interest in his job. He has no incentive, no love for what he is doing, or, in Dr. Robbins' words, "no feeling of this is what I want to do."

All work done by the work phobic is done under pressure either from without or from within in answer to the fear of dismissal or disgrace. It is bitterly resented and eagerly resisted.

In the work phobic, all spontaneity and initiative have been crushed.

"The play attitude," said Dr. Robbins, "has disappeared. Work becomes then not a part of the self, willingly embraced and freely expressed, but an enemy. An enemy so powerful that it can be fought only by reproachful and defiant silence, inertia."

Every business executive is familiar with the problem presented by this deadening, depressing, baffling inertia.

The work phobic may never openly rebel. He may never refuse a task or flout an order. He conforms with outward submissiveness. Yet, mysteriously, the work doesn't get done.

Perhaps sickness intervenes. It is an easy matter for the work phobic to worry himself into a real illness in the face of a difficult job to be done. Headaches and colds not only provide relief from the necessity of facing the task, but may even bring sympathy and flowers instead of a possible reprimand for slipshod work.

Compensation Neurosis

The "compensation neurosis" familiar to those administering workmen's compensation plans is a disease that afflicts the work phobic. A physician who specializes in diseases of the skin recently told me that he has a number of very persistent cases of skin trouble that seem caused by the "compensation neurosis." Skin diseases are aggravated and in some cases perhaps caused by nervous conditions.

The fears and worries of the work phobic in connection with his job may bring on such a disease. He is awarded compensation or illness insurance. And, although he is not consciously malingering, nevertheless just so long as the compensation keeps up, the skin trouble never disappears.

Accidents happen to the work phobic. These cannot be called deliberate sabotage. They seem genuine enough.

Acting as camouflage for the inertia of the work phobic are often the most extravagant sorts of exalted ambitions.

Now dreams of heroic achievement are not abnormal, in themselves. Scientific achievement is based on the efforts of those who have cheerfully attempted the impossible.

In a child or developing young person, daydreams of fantastic wealth, power and accomplishment are normal and healthy expressions of the growing personality. In such expansive dreams, the personality puts forth new shoots and determines the direction of natural development.

But in an adult, such unrealistic dreaming is usually a retreat from reality rather than a feeling out toward it. It is a way of saying to oneself, "Never mind if I can't do this stupid job, I am going to do much greater things later on."

"A child or an adolescent may have, to us, a seemingly very expansive ambition," Dr. Robbins explained, "without being motivated by anxiety. An adult cannot.

"To a child, it may well serve a healthy function of expanding assertiveness . . . To an adult it increases his anxiety, furthers his inter-personal remoteness and enhances his destructiveness both to himself and others."

Distinguished from Ambition

It is difficult, sometimes, to distinguish between laudable ambition and the grandiose aims of the neurotic.

An example of the distinction is given by Dr. Robbins. When a young woman with a flair for imaginative writing dreams of becoming another Keats or Byron, it is a legitimate ambition. But if she has reached the age of 55 and has never done any writing and still dreams of being another Shakespeare, that is an extravagant idea.

The neurotic seldom does anything about his grand ideas. When the time comes for action, a new plan is developed and the old one abandoned.

"A typical feature of the extravagant aspiration is the implicit compulsion in the neurotic to be not only good or among the best in a chosen field, but to be supreme, unique, occupying a singularly untouchable position," Dr. Robbins pointed out.

"The goal is exclusive possession of the pinnacle, above reproach or criticism, the subject of universal admiration.

Must Be First

"The need for originality is an obsession—an originality difficult to obtain for many reasons, but especially because it hopes to deny the work of all others. An idea dare not be built upon the accumulative knowledge of centuries, but must be entirely novel, resting on no base but its own.

"Each bit of achievement must be revolutionary and contain within it no reference to the past, or gap to be filled in by the future. It must come into being as perfect—and furthermore without the expenditure of too great an effort."

"The neurotic wastes much of himself and his life, nevertheless the secret hope is that each ambition will be fulfilled immediately.

"The disturbed aim has an indescribable urgency about it that recognizes no limitations and brooks no obstructions. The writer must complete his play over night, produce it on the second, be acclaimed as the outstanding playwright of the age on the third."

It is a mistake to take too lightly the absurd ideas of neurotics. Such persons are ill just as are patients with pneumonia or heart disease. They are pathetically dependent upon their fantastic notions to bolster weakened personalities and cloak the worries they dare not face.

Dr. Robbins tells of a young woman who built up a fiction of illness and injury to hide from herself the fact that she had become mentally incapable of the work required of her in her office. When the edifice of her fabrications was toppled over and she had to face the fact of her mental disability she rushed in front of a truck and was immediately killed.

Exalted ambitions, combined with the powerful inertia of the work phobic, more commonly lead to such substitutes for labor as cheating, stealing, bluffing and sponging.

Check-Casher

The work phobic is often a ready check-casher and until-payday-borrower. When checks are returned for "insufficient funds," a good bluff backed by more fortune-making plans serves as security for another loan to cover the defaulting.

"That such substitutive activities are profoundly destructive to others is all too obvious," Dr. Robbins comments. "That they do something to the self other than arouse misgivings of integrity is equally true but not so obvious.

"Whereas, genuine resources and fertility demonstrated by actual productivity may have originally been present, where these secondary trends become prominent, even if quite unconscious, sterility results. The bluff becomes little more than an empty shell, although he may have had at first a great deal upon which to base his assumptions.

"The cheat or plagiarist is caught up in a dizzy whirl necessitating increased dishonesties in order to maintain a position becoming increasingly precarious.

"The sponger finally loses all need to develop independence. Energies are directed towards keeping up the pretense and the very insecurity and flimsiness of the whole structure gives the facades their value, gives the pretenses their preciousness instead of the more genuine attitudes.

"There is no sincere effort then to develop the self or the self's interest which makes for positive productivity and creativeness, but only interest in maintaining the front.

"What actual potentiality may have been present originally is dried up. The person may become much like a polished apple with a rotten core. The appearance is the most valued asset, and great anxiety occurs whenever a threat to the facade or a 'seeing through' is imminent."

This article was edited from manuscript prepared by Science Service for use in illustrated newspaper magazines.

Science News Letter, December 9, 1939

GENUINE ANTIQUE

Beads a third of a billion years old make up this necklace, pictured by George A. Smith, supervising principal of the Quarryville, Pa., schools. They are joints of sea lily (crinoid) stems, left as fossils in the limestone strata laid down by the Devonian sea that covered much of Pennsylvania. Picked up and strung just as they weathered out, they make nice beads.

PSYCHOLOGY

Groups Differ on How to Keep America Out Of War

This is one of a series of articles, prepared by the Society for the Psychological Study of Social Issues especially for release through Science Service, on current research pertaining to the present emergency.

DIFFERENCES of opinion on how to keep America out of war are more marked among different political or religious groups than among different occupations, income levels or educational groups.

Fourteen questions put to many different sorts of people by Prof. Ralph H. Gundlach, of the University of Washington, Seattle, Wash., revealed whether they favored militaristic or non-militaristic measures to protect America's neutrality. Militaristic measures represented opposition to any cutting down of expenditures for armaments, opposition to unions as a bulwark against war and fascism, to the social ownership of industry, to the lowering of tariffs and reciprocal trade agreements, and to internationalism. They represented approval of more nationalism in the schools and the press. Non-militaristic measures represented the opposite of each of these views.

The groups of men favoring the most militaristic measures are members of the National Guard, members of veteran groups, men who voted for Landon, business men and supervisors, men whose income is $4,000 or more, and Catholics.

At the other extreme stand the groups who oppose militaristic measures: they belong to anti-war societies, they voted for Browder and Thomas, are Quakers, social scientists, those who profess no religion, and teachers.

Women favor fewer militaristic measures than men. The two female groups most in favor of such measures are those who voted for Landon and Catholics. Next in order come clerks and teachers.

At the other extreme are those who voted for Thomas, members of anti-war groups, those who profess no religion, and—in contrast to men—those women whose family income is $4,000 or over. Women with lower family incomes tend to favor more militaristic measures.

It was found that workers do not differ significantly from owners in respect to the measures proposed to keep this country at peace, nor do the rich differ from the poor or the educated from the uneducated.

Those occupational groups which tend to favor militaristic measures are business men and supervisors. The groups opposed to militaristic measures are college professors in the social sciences, male teachers, and professionals. Skilled and unskilled workers stand in about the middle of the occupational series, whereas clerks and salesmen are more like those approving of extreme militaristic measures.

Many of the groups favor militaristic measures on some questions and non-militaristic ones on others. Farmers favor tariffs but are opposed to international alliances and the possibility of a United States of the World; and they are slightly opposed to organized labor. The labor groups, although they tend to favor non-militaristic measures, are strongly in favor of tariffs, more armaments, and the jingoistic statements that "anyone who attacks our vital interests must count on a fight to a finish."

Catholics are on the militaristic side on every item except two: they favor labor unions above the average and they look with some favor upon social ownership. Protestants favor fewer militaristic measures than Catholics in general, although they are as much opposed to labor unions as Catholics are in favor of them. People professing the Jewish religion are opposed to militaristic measures on all questions except the two which propose both military protection to American citizens and their trade abroad and the defense of this country's honor and vital interests with armed might.

Science News Letter, December 9, 1939

From Page 375

much accumulated debris over them that they are conical or semispherical mounds. But the mounds would offer welcome military advantage. It would be easy to tunnel into them and build munition dumps, too.

Even in the Alps, one of the most formidable barriers to human transit without mechanic aids, nature decided the courses of roads eventually to be broken by man. Some of the major passes of the Alps were crossed by man as early as the Old Stone Age. In the New Stone Age there were actually settlements in the passes about 3000 B. C. Archaeological investigation has shown that settlements and cemeteries belonging to the Bronze Age and the Iron Age indicate a continued stream of logical use of the convenient transit route.

Hannibal's crossing of the Alps with elephant units is a well known episode in Europe's military history, though the actual route he used is still disputed. The Roman routes in the Alps fell into disuse and ruin during the Middle Ages, yet the heritage from prehistoric periods was handed down all the way to our times. Certainly the Brenner Pass would play an extremely important role should the current war reach into the sub-Alpine area.

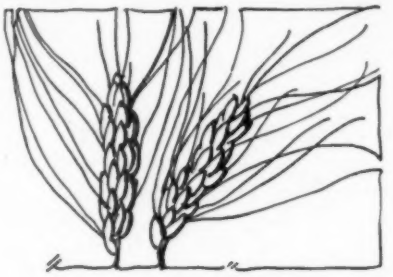
If World War trenching activities damaged some valuable records of past human activity, they left, on the other hand, some archaeological deposits revealed in plain sight, for us to find.

Archaeological study of Europe's ancient settlements, cemeteries, and battle lines, interrupted by present conditions, shows that combats of major proportions were waged in various parts of the continent during the New Stone, Bronze, and Iron Ages. Fortified settlements equipped with palisades and moats, weapons, grave offerings, and wound-marked bones, all provide a mute yet revealing witness to a seemingly incessant succession of Europe's battles.

Science News Letter, December 9, 1939

NUTRITION

NATURE RAMBLINGS
by Frank Thone



Nutritional Needs

FOOD that you eat may have all the calories you need and thousands to spare and yet leave you starving, if calorie content is the only criterion in its selection and choice of other essential factors is neglected. Emphasis is placed on this point in *Food and Life*, the new yearbook of the U. S. Department of Agriculture.

The whole alphabet of vitamins, the amino acids yielded by digestion of proteins, iron, copper, calcium, magnesium, iodine—these only start the list of food elements that human beings must get if they are to be spared the "hidden hunger" of functional malnutrition.

Want of means is not the only cause of malnutrition, Secretary Wallace points out sharply in his brief preface: "The lack of common-sense knowledge of nutrition even among many well-to-do people in the United States is appalling." Yet he continues, "Probably 99 per cent of the children of the United States have a heredity good enough to enable them to become productive workers and excellent citizens provided they are given the right kind of food, proper training, and ordinary opportunities."

Following the departure made by the preceding three Agriculture Yearbooks, this year's volume is devoted to one particular subject. Various research workers in the Department contribute 57 chapters on all phases of food and nutrition.

Science News Letter, December 9, 1939

When possible, British museums are being kept open in wartime, for their educational and recreational value.

The angle at which the upper front incisor teeth fit into the jaw differs in different races, an anthropologist reports.

CHEMISTRY

Carbolic and Picric Acids And Toluol Are "Critical"

But No Chemical on Essential List Can Be Classified As "Strategic"; Commercial Chemicals Not Pure Enough

TOLUOL, by-product of coke ovens, is the most "critical" of all the chemicals which the nation would need if it were forced to enter a war, Prof. Clark S. Robinson, chemical engineer of Massachusetts Institute of Technology, told the meeting of the American Institute of Chemical Engineers in Providence.

The essential chemicals needed to make explosives and war agents in large quantities include: acetic acid, acetone, ammonia, benzol, caustic soda, chlorine, ethyl alcohol, hydrochloric acid, methanol, nitric acid, phenol, picric acid, potash, soda ash, sulfuric acid, toluol.

The bulk of these chemicals go into the manufacture of explosives of various sorts and chemical agents. Practically all modern explosives are mixtures of nitrated organic compounds which require the use of sulfuric and nitric acids in their manufacture. Ammonia goes into ammonium nitrate, which is likely to be most widely used in high explosives, and into ammonium picrate which is used in armor piercing projectiles on account of its insensitive character. Acetone, acetic acid, and the alcohols are used as solvents for lacquers, plastics, and smokeless powder. Chlorine is the basic raw material used in the synthesis of most chemical war agents such as mustard gas, chlorpicrin, and so forth. Toluol is the basis for the famous T.N.T. and is largely used in other, less widely known, kinds of explosives.

Bottleneck in production comes because many of these chemicals, as made at present for commercial use, do not have sufficient purity needed in explosives, which must remain in good condition regardless of the climate and its conditions of temperature and humidity in which the explosives will be used.

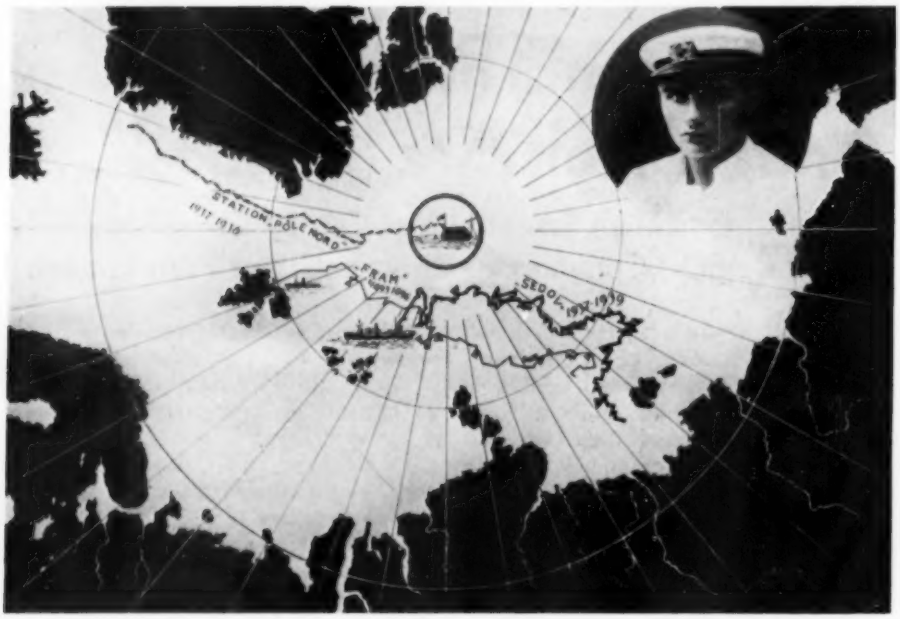
No chemical of the essential list, said Prof. Robinson, can be classed as strategic. Three, however, he describes as critical: phenol, picric acid and toluol.

In discussing M Day plans for the chemical industry, Prof. Robinson noted that none of the chemicals cited are used, in themselves, as ammunition. Rather they are the raw materials for munitions and must be fabricated in special munitions plants. Such plants, he added, are virtually non-existent on a scale suitable for wartime needs. Probably only when and if war is declared will they be built.

Science News Letter, December 9, 1939

Finland is about 35% forest and 11% lakes.

Home economists say: Potatoes hold their vitamin C best when baked, next best when steamed, then boiled, mashed, and fried.



THREE FAMOUS DRIFT COURSES

The "Fram" (1893-96), the Soviet North Pole ice floe station (1937-38), and the "Georgy Sedov" (1937-39). Inset: Capt. Konstantin Badigin, commander of the ice-breaker "Georgy Sedov."

ECONOMICS

Fear Of "Have Nots" Seen Back Of Activity In New Guinea

THE NETHERLANDS, aware that Japan is "interested" in her precious Dutch colonies in the South Seas, has been entrenching for some time and with determined activity in the most neglected of these colonies—Dutch New Guinea.

In the past five years, official personnel in the Dutch half of the big island of New Guinea has increased fourfold, says a report on Dutch activity to the American Council of the Institute of Pacific Relations, in New York. Forestry and farm experts have been set to testing the island's resources. Experimental plantings of rubber, coffee, cotton, and kapok have been made, and all except cotton have given promising returns.

A privately owned petroleum company and a mining company within the past two years have been exploring, using airplanes to cross fever-ridden jungles and rugged mountains. Deep boring for oil began this year. Another development company is interested in rubber, wood and sea products of the island.

Efforts to plant settlements of Europeans or Eurasians from other parts of the Dutch Indies have proved least successful of the ventures, and are discouraging to plans for speedy large-scale colonization.

Reason for intensive activity is the desire of the Dutch to show they are quite able to develop this region, thus wiping out any arguments to the contrary which "have-not" nations might raise. Also, Japan since 1932 has maintained an economic toe hold in Dutch New Guinea. Taking over an unsuccessful German concession, a Japanese firm collects damar gum, tries to grow cotton by aid of about 1,000 Japanese coolie laborers, and does a little sheep raising. A proposal in 1937 in Japan, to the effect that Japan gain a perpetual lease for colonization in Dutch New Guinea, aroused the Dutch to indignation and intensified their determination to possess this neglected colony in the full sense of the word.

Science News Letter, December 9, 1939

GEOGRAPHY

Floating Laboratory Ship Drifts in Arctic Ice

TWO YEARS adrift in the Arctic ocean, the Soviet icebreaker *Georgy Sedov* is continuing her ice-locked voyage in the interests of science. She began her drift on Oct. 23, 1937, and is now far to the north of European Russia, a little to the east of the meridian of Archangel.

Locked in the ice, the *Georgy Sedov* progresses only as ocean currents and winds move her. The going is exceedingly slow—60 to 75 miles a month. This, however, matters little, for the ship is primarily a floating laboratory, for the systematic recording of data on meteorological and oceanographic conditions. The drift roughly parallels the famous course of the Norwegian ship *Fram* in 1893-96, but is considerably to the north. It lies over a part of the Arctic never before visited by ship or airplane.

When the *Georgy Sedov* started she was accompanied by two other icebreakers, the *Sadko* and the *Malygin*. These ships, however, returned in August, 1938, leaving their sister craft to continue her strenuous voyage alone.

Science News Letter, December 9, 1939

If experimenters' efforts to develop more efficient wood-burning stoves and furnaces succeed, they will open up wider markets for fuel wood, thereby helping woodland owners to sell much inferior wood that goes to waste.

ORNITHOLOGY

Eagles Did Not Fight When Nest Was Invaded

See Front Cover

EAGLES do not always fight fiercely when a stranger approaches their nest. When Frank and John Craighead, authors of the new falconry book, *Hawks in the Hand,* climbed into a bald eagles' nest in a big sycamore tree on an island in the Potomac, this is exactly what happened: "We took several pictures of the young eagles, and while doing so we noticed that the parent birds were circling much closer to us and occasionally swooping almost to the nest. Their plaintive cries became louder and more excited. Finally one of the eagles perched on a neighboring tree."

That was all. Not until the Craigheads left the nest did the mother attempt to return to her young.

The Craigheads are twin brothers, now graduate students at the University of Michigan, who took up the ancient art of falconry as a scientific hobby while they were high school boys. They captured and trained their own hawks, and even trained owls. In their book they tell of their adventures, as far afield as Yellowstone National Park and the Canadian forests, in search of new species of hawks to study and photograph.

Science News Letter, December 9, 1939

BACTERIOLOGY

Bacteria and Fungi in Soil Help Prevent Erosion

SOIL erosion prevention is not a matter of grass planting and reforestation alone. The microscopic "forests" of bacteria, fungi and other microörganisms that live in the soil also play an important role in holding it in place, it has been demonstrated in experiments by Drs. Selman A. Waksman and James P. Martin of the New Jersey Agricultural Experiment Station.

Microbes can bind the soil in several different ways, they explain (*Science,* Sept. 29). Fungi and some bacteria form subterranean networks of thread-like growth, that have considerable mechanical holding power. Bacteria secrete slimy substances that glue soil particles together. All the organisms of decay act on dead leaves and other plant parts to change them into humus, which has a recognized high value in soil conservation.

Science News Letter, December 9, 1939

•First Glances at New Books

Astronomy

STARS AND MEN—Stephen A. Ionides and Margaret L. Ionides—*Bobbs-Merrill,* 460 p., $4. Delightful reading for the layman with an interest in astronomy is this book which, in conversational style, dips into the ancient, old and modern of astronomy to tell its story. Time, the seasons, the sun, the moon, comets, eclipses, the calendar, stars, navigation, geography and the cosmos; all these and more are included.

Science News Letter, December 9, 1939

Nutrition

FOOD AND LIFE, Yearbook of Agriculture 1939—U. S. Department of Agriculture—*Govt. Print. Off.,* 1165 p., $1.50. See page 381.

Science News Letter, December 9, 1939

Ornithology

THE GEESE FLY HIGH—Florence Page Jaques; Illus. by Francis Lee Jaques—*Univ. of Minn.,* 100 p., $3. A personal narrative of the ways of strong and noble birds, embellished with black-and-white drawings of breath-taking beauty. If you count a birdlover or a really civilized sportsman among your friends, here is an ideal Christmas gift.

Science News Letter, December 9, 1939

Paleobotany

LEAVES AND STEMS FROM FOSSIL FORESTS, A Handbook of the Paleobotanical Collections in the Illinois State Museum—Raymond E. Janssen—*Illinois State Museum,* 190 p., $1.25. Well-written descriptions of the collection of coal-bed plant fossils prepared by the remarkable technique of George Langford (*See SNL,* Dec. 2) and now deposited with the Illinois State Museum. The illustrations do justice to the beauty of the originals.

Science News Letter, December 9, 1939

Biology

BASIC BIOLOGY—Cyril E. Abbott—*Burgess,* 111 p., $2.

Science News Letter, December 9, 1939

Taxonomy

KEYS TO THE PHYLA OF ORGANISMS, Including Keys to the Orders of the Plant Kingdom—Fred A. Barkley—*For sale at Associated Students' Store, Montana State Univ., Missoula, Mont.,* 39 p., 75c. A working key intended for university student use, carrying all organisms as far as their phyla, and plants as far as orders. The classical division into plant and animal Kingdoms is partially abandoned and two additional Kingdoms (Monera and Protista) are put at the bottom of the ladder.

Science News Letter, December 9, 1939

General Science

THE NOTEBOOKS OF LEONARDO DA VINCI (New one-volume ed.)—Edward MacCurdy, trans. and ed.—*Reynal & Hitchcock,* 1247 p., $5. Because of the European crisis, it will not be possible to import more copies of the two-volume de luxe edition issued in 1938. The entire work has been reset and published in attractive form in one volume. See SCIENCE NEWS LETTER of Nov. 19, 1938.

Science News Letter, December 9, 1939

Biology

GARDEN CREATURES — Eleanor King and Wellmer Pessels—*Harper,* 64 p., $1.25. Easy, chatty little descriptions of insects, spiders, worms, toads, etc., with plenty of striking illustrations.

Science News Letter, December 9, 1939

Juvenile

PORKEY, AN ARKANSAS RAZORBACK—James L. Lockhart—*Albert Whitman,* 64 p., $1. How a razorback shoat went to college, wore a Freshman's green cap, and helped win a football game.

Science News Letter, December 9, 1939

Paleontology

CAMBRIAN MEROSTOMATA—Gilbert O. Raasch—*Geological Soc. of Amer.,* 146 p., 21 pl., $1.25. A monograph on an interesting and obscure group of extinct arachnida.

Science News Letter, December 9, 1939

Chemistry

INTRODUCTION TO PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY—L.Earle Arnow—*Mosby,* 555 p., $3.50. An elementary text for nurses' training schools, with laboratory experiments, questions and problems.

Science News Letter, December 9, 1939

Archaeology

AN ARCHAEOLOGICAL SURVEY OF NORTHWESTERN ARIZONA INCLUDING THE DESCRIPTIONS OF FIFTEEN NEW POTTERY TYPES—Harold S. Colton—*Northern Ariz. Soc. of Sci. & Art,* 29 p., 80c.

Science News Letter, December 9, 1939

Hobbies

LOW-COST CRAFTS FOR EVERYONE—H. Atwood Reynolds—Greenberg, 332 p., $2.50. Price correction.

Science News Letter, December 9, 1939

Engineering

A HISTORY OF THE GROWTH OF THE STEAM-ENGINE (Centennial ed.)—Robert H. Thurston—*Cornell Univ. Press,* 555 p., $3. Here is one of the most famous and widely used books on the history of the steam engine ever written, first published in 1878, and brought up to date by additional material. As director of the Sibley College of Mechanical Engineering at Cornell University from 1885-1903, Prof. Thurston was a recognized authority on the subject. Despite the appearance of newer books, the Thurston classic is highly regarded for the period it covers. Now, with a supplementary chapter by Prof. W. N. Barnard, Prof. Thurston's successor at Cornell, it has been modernized.

Science News Letter, December 9, 1939

Ornithology—Photography

HAWKS IN THE HAND, Adventures in Photography and Falconry—Frank and John Craighead—*Houghton Mifflin,* 290 p., 57 pl., $3.50. See page 383.

Science News Letter, December 9, 1939

Documentation—Sociology

RESEARCH MATERIALS IN THE SOCIAL SCIENCES—Louis Kaplan, comp.—*Univ. of Wisconsin Press,* 36 p., 60c. This small booklet contains "an annotated guide to bibliographies, newspapers and periodicals, government documents, manuscripts and other source materials, dissertations, book reviews, statistics and general reference works, with instructions for obtaining materials through inter-library loans."

Science News Letter, December 9, 1939

Botany

GENUS LABORDIA, HAWAIIAN EUPHORBIACEAE, LABIATAE AND COMPOSITAE—Earl Edward Sherff—*Field Museum of Natural History,* 174 p., $1.25.

Science News Letter, December 9, 1939

Technology

A. S. T. M. STANDARDS ON TEXTILE MATERIALS, October, 1939—*American Society For Testing Materials,* 324 p., $2.

Science News Letter, December 9, 1939

Bacteriology

BACTERIOLOGY—William W. Ford—*Hoeber,* 207 p., $2.50. A compact history of bacteriology, from pre-microscopic times down to latest developments in virus and 'phage. An especially valuable feature is the 32-page bibliography.

Science News Letter, December 9, 1939